BIOMETHANATION OF PALM OIL MILL EFFLUENT (POME) BY ULTRASONIC-MEMBRANE ANAEROBIC SYSTEM (UMAS)

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SUPERVISOR'S DECLARATION

We hereby declare that we have checked this thesis and in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Chemical Engineering.

Signature :
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Date :

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree

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LIST OF SYMBOLS

V	Volume
Q	Flowrate
Cd	Solid Concentration in the digester
Cw	Solid Concentration in the waste
Qw	Volume wasted each day
D_1	Dissolved Oxygen value in initial sample
D_2	Dissolved Oxygen value in final sample

LIST OF ABBREVIATIONS

POME	Palm Oil Mill Effluent
UMAS	Ultrasonic Membrane Anaerobic System
COD	Chemical Oxygen Demand
BOD	Biochemical Oxygen Demand
TSS	Total Suspended Solids
HRT	Hydraulic Retention Time
EQA	Environmental Quality Act
CPO	Crude Palm Oil
AnMBR	Anaerobic Membrane Bioreactor
HRAS + AD	High Rate Activated Sludge + Anaerobic Digestion
MPOB	Malaysia Palm Oil Board
OLR	Organic Loading Rate
SRT	Solid Retention Time
VFA	Volatile Fatty Acid
NF	Nanofiltration
UF	Ultrafiltration
MF	Microfiltration
MW	Molecular Weight
PPME	Pulp and Paper Mill Effluent
PNS	Purple nonsulfur bacteria
SBR	Sequencing Batch Reactors
TCOD	Thermophilic Chemical Oxygen Demand
SVI	Sludge Volume Index
AAS	Anaerobic-Aerobic Sequence
ARG	Antibiotic-Resistant Genes
MFC-AFMBR	Microbial Fuel Cell and Anaerobic Fluidized Bed Membrane Bioreactor
MFC	Microbial fuel cells
GAC	Granular Activated Carbon
WAS	Waste-Activated Sludge

MEC	Microbial Electrolysis Cells
DO	Dissolved Oxygen
VSS	Volatile Suspended Solids